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Heavy quark dynamics via Gribov-Zwanziger approach

We investigate the momentum-dependent drag and diffusion coefficient of heavy quarks (HQs) moving in the quark-gluon plasma (QGP) background. The leading order scattering amplitudes required for this purpose have been obtained using the Gribov-Zwanziger propagator for the mediator gluons to incorporate the non-perturbative effects relevant to the phenomenologically accessible temperature regime. The drag and diffusion coefficients so obtained have been implemented to estimate the temperature and momentum dependence of the energy loss of the HQ as well as the temperature dependence of the specific shear viscosity (η/s) of the background medium. Our results suggest a higher energy loss of the propagating HQ compared to the perturbative estimates, whereas the η/s is observed to comply with the AdS/CFT estimation over a significantly wider temperature range compared to the perturbative expectation.

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